

Dornier 228 Advanced Commuter (AC) Facts & Figures



Together
ahead. **RUAG**

Overview



Performance

Page 16

Specifications

Page 14

Certification Basis

Page 17

Operations

Page 4

Construction and Fuselage

Page 18

Contents

Page 30



Operations Support

Page 28

Main Wing

Page 20

Glass Cockpit

Page 24

Engines and Propellers

Page 22

Operation Challenges

The Dornier 228 not only proves to be a versatile platform for Special Mission applications but it is also the perfect choice when it comes to passenger and cargo transportation. Its high productivity and economy, attractive price-performance ratio, outstanding performance, and high levels of safety and comfort make the Dornier 228 an ideal advanced commuter aircraft.

A challenging environment

- Wide range of runway surfaces
- Operation in high temperatures and at high altitudes
- Small airfields/aprons → short turnaround times
- Short runways
- Remote airfields with limited infrastructure
- Travelers with bulky hand luggage



Unprepared airfield operation, Nigeria



Short runway (Tensing-Hillary Airport 9100 ft, Lukla, Nepal)



Cargo transport, Norway



Passenger transport, Venezuela

Advanced Commuter

The Dornier 228 is the most advanced aircraft in its class, offering unsurpassed effectiveness and efficiency with superb versatility. No other aircraft can transport as many passengers over a comparable distance as fast as the Dornier 228. This is why operators all over the world count on it when it comes to demanding operations.

Key features are the long range, high utilization rates and high payload – and all this at impressively low operational costs. With the aircraft state-of-the-art technology, pilots are able to maintain superior situational awareness throughout the most demanding missions. No other plane in this category combines safety and efficiency to the level offered by the Dornier 228.

Best platform in its class

Operational advantages

- Speed performance: high speed cruise and range of operating speeds
- Range: well in excess of 1000 Nm with a significant payload
- Productivity and flexibility: largest payload/range envelope
- UNIVERSAL® military grade avionics

Economic advantages

- Lowest fuel consumption per Nm
- Lowest operating cost per Nm

Payload advantages

- PAX space/seating comfort in individual seats
- Cargo transportation volume and loading
- Cargo/PAX versatility
- Quick swap cargo door

Operations All Around the World



New Central Airservice, Japan

Passenger and cargo transport



Agni Air, Lukla, Nepal

Passenger and cargo transport



VEXIMCA, Venezuela

Passenger and cargo transport



Aerocardal, Chile

Passenger and cargo transport



Arcus Air, Germany

Passenger and cargo transport



Lufttransport AS Norway

Passenger and cargo transport



Light Transport

The Dornier 228 is «flying flexibility». The aircraft can be quickly re-configured from passenger to cargo transportation layout with minimum personnel.

Aircraft & performance features

- Renown short-field performance
- Renown hot and high performance
- Unprepared airfield operations
- Simple single point refueling in 10 min
- Pax/cargo door swap in 15 seconds
- Pax to cargo configuration change in about 1h by one person



Cargo door



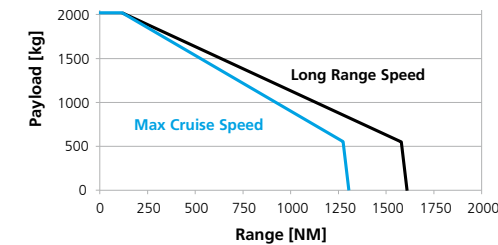
Pax door



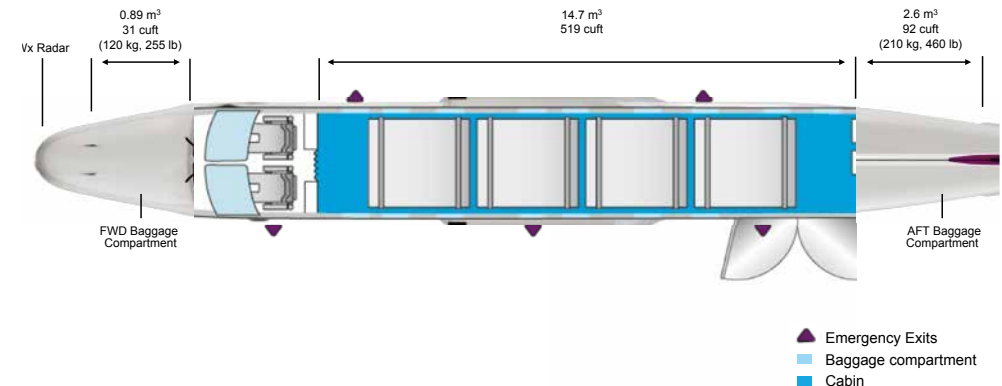
Cargo Transport

Seats can be quickly removed to convert the cabin for cargo transportation; to ease loading the normal passenger door can be opened sideways, which together with the adjacent door, creates a massive opening for bulky or heavy cargo. Parcels and crates of all sorts can be distributed quickly and easily inside the cabin by means of the integrated roller system. While smaller and lighter cargo items can be secured with nets, bulky and heavier cargo stacked on pallets can be locked on the seat rails.

The rectangular cabin with its 23 ft of usable length significantly eases the transportation of bulky cargo or longer goods. Whatever your cargo may be, a total of 2 tons (512 cu ft) can be transported.



Cargo layout



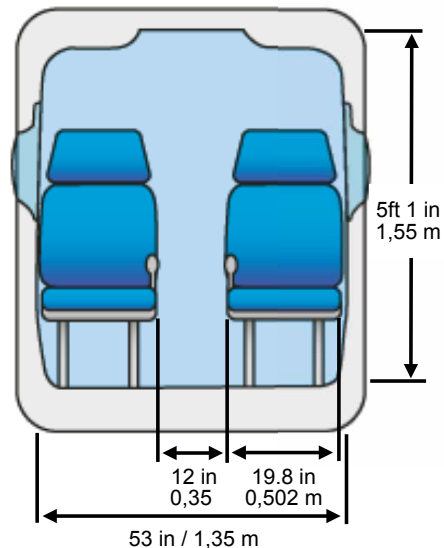
Passenger Transport

The Dornier 228 is a leader not only in terms of productivity, safety, reliability and up-to-date technology, but also comfort. Every seat in the commuter version of the aircraft is located next to a window and the aisle. In addition, passengers enjoy ample head and shoulder room thanks to the aircraft's unique cabin cross-section. These are benefits conventional oval cross-sections cannot offer.

Comfort and space

The Dornier 228 is the only aircraft in its class that offers air-conditioning as standard equipment. Large windows create a light-filled, welcoming atmosphere in the cabin. RUAG is ready to equip the cabin to meet every client's wishes, and the spacious interior offers a wide range of possibilities. In this way passengers will have every comfort they need.

Further options for the Dornier 228 include a VIP configuration offering additional wellbeing. The aircraft's low noise and low vibration 5-bladed propellers make the cabin of the Dornier 228 the quietest in its class.



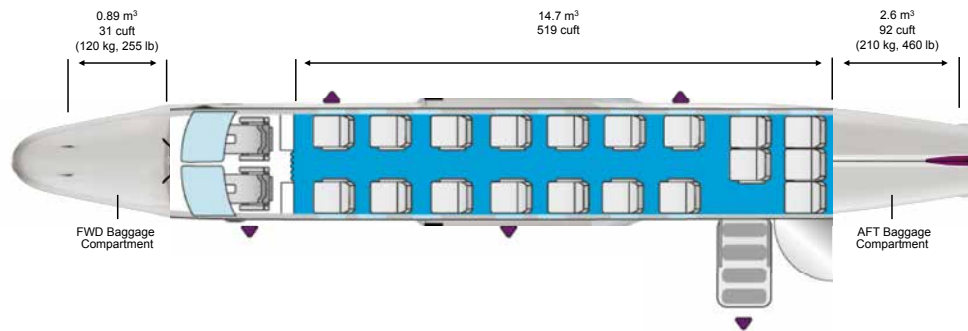
In the Dornier 228 cabin every seat is located next to a window and the aisle.

Passenger Transport

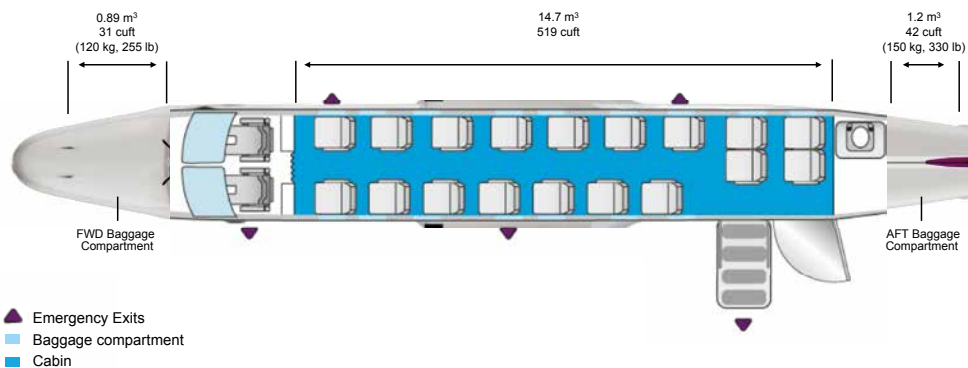
A high standard of passenger comfort is the primary consideration in the Dornier 228 design. The standard cabin consists of 19 individual passenger seats with 30-in pitch and offers airline standard passenger comfort in single seat configuration.

Its rectangular cross-section is the ideal shape for utility applications and provides passengers with ample space at shoulder height, extra passenger headroom and cargo storage. Passengers enter through a passenger door with built-in steps on the LH side of the rear fuselage. An 18 seats layout, with a toilet located aft of the cabin, is also available.

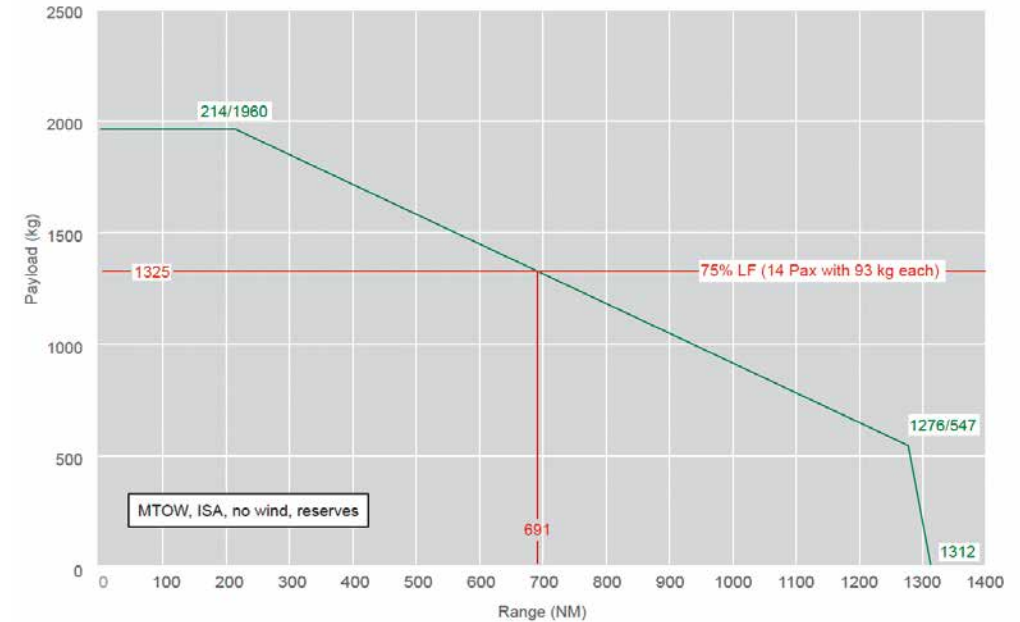
PAX layout – 19 passenger seats



PAX layout – 18 passenger seats, toilet



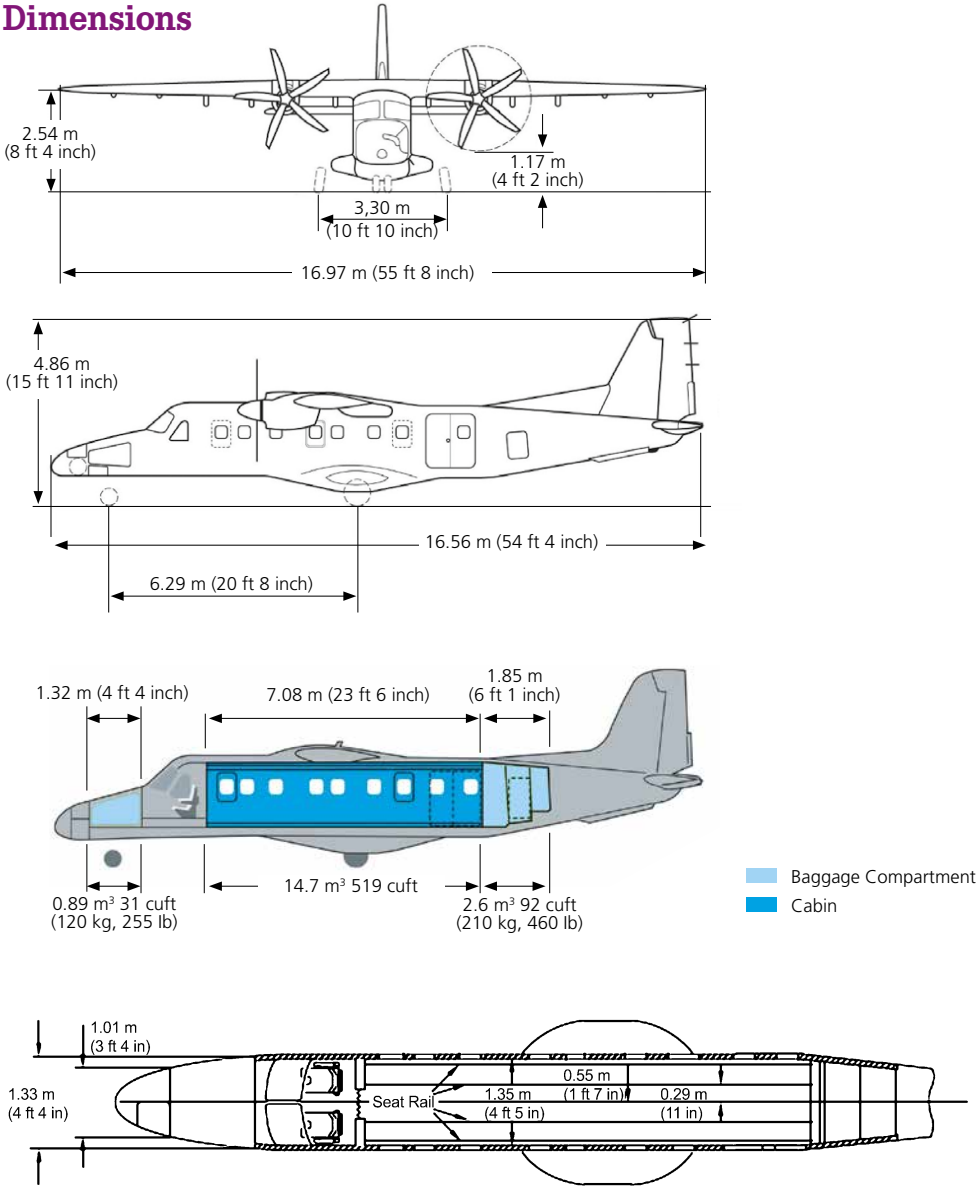
Payload/Range Diagram



Aircraft

Specifications

Dimensions



Principal dimensions	
Overall height	15 ft 11 in (4.86 m)
Overall length	54 ft 4 in (16.56 m)
Wing	
Span	55 ft 8 in (16.97 m)
Area	344.3 ft² (32.00 m²)
Aspect ratio	9.0
Taper ratio	0.7
Sweepback of leading edge inboard	0°/outboard 8°
Vertical stabilizer	
Height	8 ft 10 in (2.70 m)
Area	64.6 ft² (6.0 m²)
Aspect ratio	1.50
Taper ratio	0.46
Rudder area	16.1 ft² (1.5 m²)
Rudder deflection	-24°/+24°
Passenger compartment	
Overall length, max.	23 ft 3 in (7.08 m)
Maximum width	4 ft 4 in (1.328 m)
Maximum height	5 ft 1 in (1.55 m)
Horizontal stabilizer	
Span	21 ft 2 in (6.45 m)
Area	89.6 ft² (8.33 m²)
Aspect ratio	5.00
Taper ratio	1.00
Elevator deflection	-30°/+25°
Ailerons	
Span	8 ft 10 in (2.69 m)
Area	2×14.5 ft² (2×1.345 m²)
Deflection (Flaps 0°)	25° up/18° down
Chord	30%
Doors (height × width)	
Cockpit door	2 ft 9 in × 2 ft 2 in (0.84 m × 0.65 m)
Passenger airstair door	4 ft 5 in × 2 ft 1 in (1.34 m × 0.64 m)
Passenger/cargo door (both door panels are open)	4 ft 5 in × 4 ft 2 in (1.34 m × 1.28 m)
Baggage door (front)	3 ft 11 in × 1 ft 8 in (1.2 m × 0.5 m)
Baggage door (rear)	2 ft 11 in × 1 ft 9 in (0.89 m × 0.53 m)
Emergency exits (3)	2 ft 2 in × 1 ft 7 in (0.67 m × 0.48 m)

Weights

Weights	lb	kg
Max. take-off weight (MTOW*)	14,110	6,400
Max. landing weight	13,448	6,100
Max. zero fuel weight (MZFW)	13,095	5,940
Operating weight empty (with 2 Pilots) (OWE)	8,598	3,900
Mission equipment (incl. operator and console)	1,047	475
Max. fuel	4,156	1,885

* e.g. optional MTOW increase to 6,575 kg (14,550 lbs) possible

Performance

With its Transport Category OEI field performance, control and engine responsiveness and wide range of operational speeds (74 to 223 KIAS), the Dornier 228 ensures safe margins throughout the entire mission envelope.

Range of take-off distance

- 2.600 ft at MTOW, ISA, SL
- 3.150 ft at MTOW, ISA+10°C, 2000 ft elevation
- 4.000 ft at MTOW, ISA+20°C, 4000 ft elevation

Accelerate stop distance range

- 2.500 ft at MTOW, ISA at SL
- 3.000 ft at MTOW, ISA+10°C at 2000 ft elevation
- 3.600 ft at MTOW, ISA+20°C at 4000 ft elevation

Range of unfactored landing distance

- 1.480 ft at MLW, ISA at SL
- 1.590 ft at MLW, ISA+10°C at 2000 ft elevation
- 1.730 ft at MLW, ISA+20°C at 4000 ft elevation

Climb at ISA, SL conditions

- normal 1570 ft/min
- single engine 400 ft/min

Speed

- max. cruise 223 KIAS
- minimum control 74 KIAS

Certification Basis

The Dornier 228 is the only 3rd-generation aircraft in its class. It has been purposely designed to match the FAR23/CS23 commuter category airworthiness standard, which assigns safety margin equivalents to transport category aircraft. Its advanced design provides the Dornier 228 with unmatched performance, payload capacity, operational flexibility and efficiency.

The Dornier 228 success is proven by the over four million hours flown to date. Based on continuous improvements and innovations, the Dornier 228 offers a high level of safety, even in its standard version, and is one of the most reliable aircraft in the world with its perfect mix of a mature design and innovative technologies.

Due to its advanced aerodynamics, the Dornier 228 is able to match or exceed the STOL performance of competing aircraft at the same payload, all while cruising up to 50 kts faster.

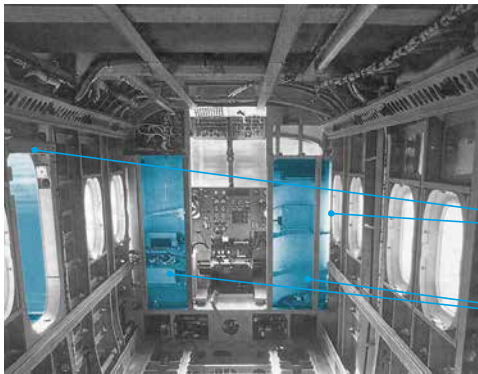
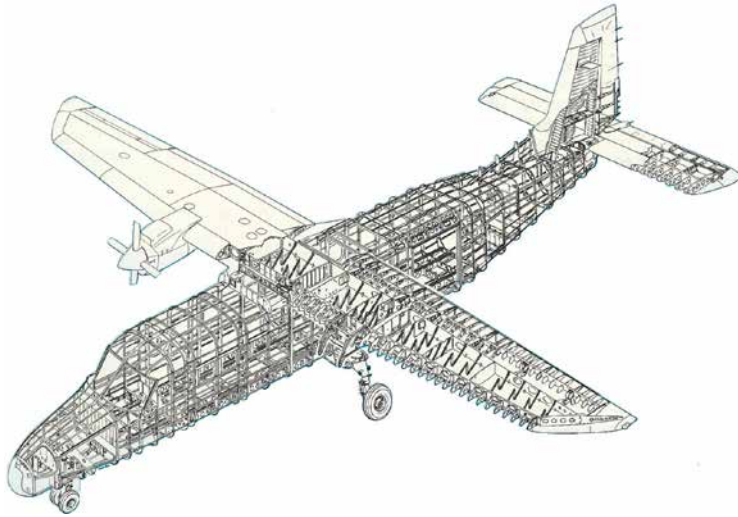


Construction and Fuselage

The structure of the fuselage is a conventional alloy construction (non-pressurized fuselage).

The structure of the wing is new technology. While a conventional wing has a main and a secondary spar, ribs and stringers and sheet metal skin – riveted together – the Dornier 228 wing structure is a box formed from four integrally milled alloy panels. Leading edge is conventional alloy sheet metal with ribs and stringers, trailing edge and Fowler Flaps are made from Kevlar®.

Empenage is conventional alloy construction
Aerodynamic cowlings (e.g. landing gear) are Kevlar®



- Conventional frame/stringer/sheet metal construction with 4 seat rails (Douglas 1 inch)
- Cables and air condition tubing installed

Emergency exits
(front right and centre left)

Electronic racks

Key advantages

- Square cross-section and volume
- Aft cargo area configurable and accessible in flight (drop-hole possible)
- 30 second quick change pax/cargo door
- Wide, light and roomy cabin
- Ample room for head and shoulders
- Extra space for cargo storage under the seats
- Additional cargo compartments (front/rear)



Aircraft

Main Wing

Airfoil specification

The outstanding wing design is the key element behind the Dornier 228 best-in-class performance.

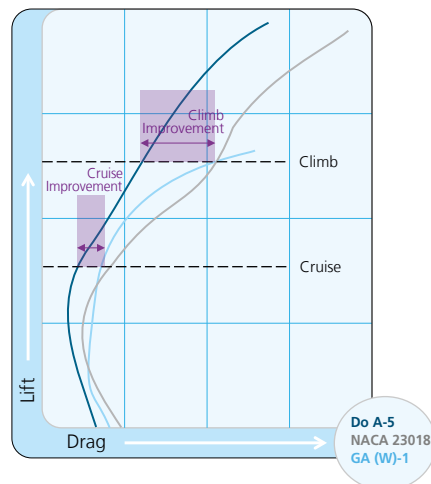
- The supercritical profile Do A-5 reduces drag by up to 30%, retains good characteristics in icing conditions, and ensures roll control even in full stalls
- The optimised wing shape keeps secondary drag as low as possible (reduced wing vortex by triangular shape of wing tips)
- The box type structure and the manufacturing process ensure the highest possible accuracy over the life cycle

Wings of excellence: the Wing of New Technology

The high performance wing of the D228 was developed by Dornier as part of the “Wing of New Technology for General Aviation Aircraft” programme funded by the German Federal Ministry of Education and Research. The objective of this program was to improve the performance and efficiency of general aviation aircraft at speeds of up to 250 KTAS. The Dornier 228 wing stems directly from this research program, the most radical evolutions being:

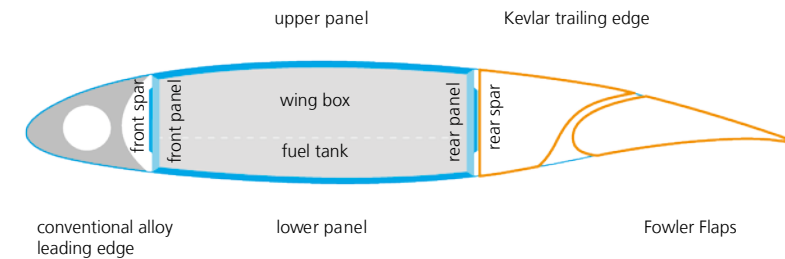
- Supercritical profile designed specifically for this aircraft (50% laminar flow)
- Trapezoidal wing with raked wing tips for enhanced pressure distribution and reduced vortex drag
- Integral milled wing panel for structural performance and reduced parasite drag

Performance with the Wing of New Technology was increased by more than 25% overall. Another reason for the better performance is the Fowler Flaps, which ensure an improved take-off and landing performance. Finally, the triangular wing tips ensure a reduction in induced drag and gentle stalling characteristics.



The high wing design make the aircraft less prone to FOD and stone damage when operating on unprepared runways. The wing box, panels and root ribs are integrally milled and serve as the integrated fuel tank. While conventional sheet metal construction is used for the leading edge part, glass-fiber reinforced plastic is used for the trailing edge, outboard wing and wing tips.

Do A-5 supercritical profile, more than 50% laminar flow



Engines and Propellers

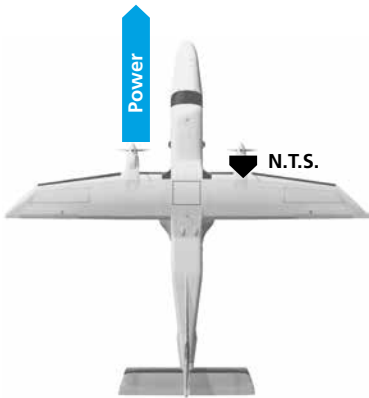


The Dornier 228 is currently the most productive, most reliable and most up-to-date aircraft in its class. And this unmatched performance has even been significantly improved by the new 5-bladed propeller in combination with the fuel-efficient TPE331-10 engine. The results are unique and outstanding mission performances and improvements over the whole flight profile.

Our complete support of the Dornier 228 includes the competence required for the regular MRO, certified safety and continued support of the TPE331 engine over its entire life cycle. RUAG is your experienced partner of choice as a Honeywell Authorised Service Centre and we invest our expertise in providing full support for TPE331-5 & -10 engines, offering both line and major maintenance, as well as hot section inspection.

Engine data	TPE331-10
Dimensions	1080 – 518 – 676 (mm)
(length – width – height)	42.5 – 20.4 – 26.6 (in)
Weight	385 lb
Pressure Ratio	10.55
Power	940 shp
Compressor bleed (max.)	10%
TBO (commercial operation min 800 h/year)	7,000 h
ESFC (Equiv. Specific Fuel Consumption T/O)	0.534 lb/hp-h

N.T.S.
Negative Torque Sensing (N.T.S.) provides automatic and instantaneous prop drag reduction



TPE331 Engine Benefits

- Low Specific Fuel Consumption (SFC)
- Efficient “front-to-rear-flow” turbine design
- Very high ram pressure recovery
- Low frontal area reducing drag to a minimum
- Instantaneous power response in all flight modes
- Automatic torque and ITT limiting system
- Automatic start sequence
- Simple Engine Anti-Ice System
- 940 SHP de-rated to 776 SHP
- Flat rated up to ISA + 30°C at SL
- Low Direct Maintenance Cost
- Time between overhaul up to 7,000 hours
- Engine Health Monitoring (optional)



5-bladed Composite Propeller

- Lighter propeller: Reduced stress on the engine and electrical system during start up
- Smaller propeller diameter: Reduced noise and increased ground clearance
- Retrofit ready: EASA STC A.S.02755, MT-Propeller



Glass Cockpit

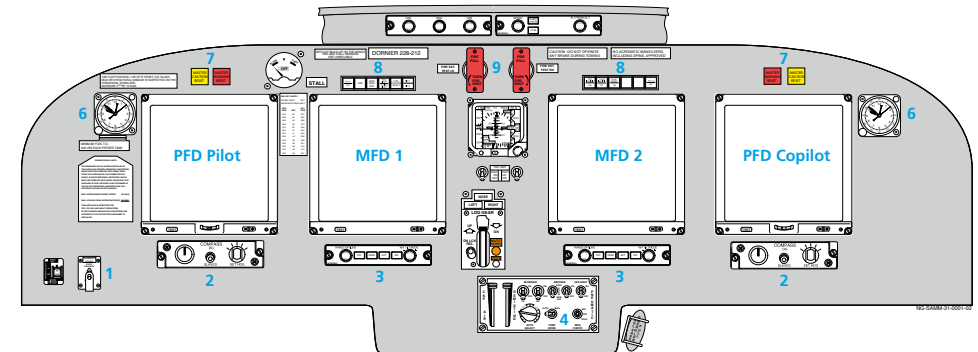
The cockpit is fitted with 4 large UNIVERSAL® displays, featuring one Primary Flight Display (PFD) and one Multi Function Display (MFD) in front of each crew member located on the central panel, additionally an Electronic Standby Instrument System (ESIS) is installed between the two MFD. Those crystal clear, sunlight readable HD displays provide the pilots with the specific information required during each phase of the flight.

Key features

- Four (4) 8.9 inch liquid crystal HD displays
- Designed for increased situational and flight safety awareness
- Primary Flight Display (PFD) with multiple display setting to match mission segment requirements
- Navigation display with TAWS overlay,
- Terrain cross-section analysis along flight path
- Multi-sensors FMS with LPV Monitor
- Emergency ESIS with navigation capability
- Charts and airport diagrams (optional)
- Checklist (optional)
- Moving Map (optional)
- Native NVG PFD/MFD display available (not add-on filters)
- Obstacle cross-section view along flight path
- Synthetic vision (optional)



Main Instrument Panel



1. ELT Control Panel
2. Pilot and Co-pilot PFD Control Unit
3. Pilot and Co-pilot MFD and WXR Control Unit
4. Air Conditioning Control Panel
5. Landing Gear Lever
6. Pilot and Co-pilot Clock
7. Pilot and Co-pilot Master Warning Master Caution Annunciator/Buttons
8. Pilot and Co-pilot NAV and Annunciator Panel
9. Engine Fire Handles
10. Emergency ESIS

Cockpit Avionics

Navigation and Pitot Static Systems

- UNIVERSAL® UNS-1Ew Flight Management System (FMS)
- Dual Revue Thommen Air Data Computer
- Dual Northrop Grumman Litef Attitude Heading Reference System
- Rockwell Collins Radar Altimeter
- Rockwell Collins Distance Measuring Equipment
- Dual Rockwell Collins VHF Navigation System
- ACSS Transponder System
- Honeywell Weather Radar (optional)
- Universal Avionics Terrain Awareness and Warning System Class A (TAWS, optional)
- ACSS Airborne Collision Avoidance System (TCAS, optional)
- Flight Director/Autopilot (optional)
- L3-Com Airborne TACAN System (optional)

Indicating Systems

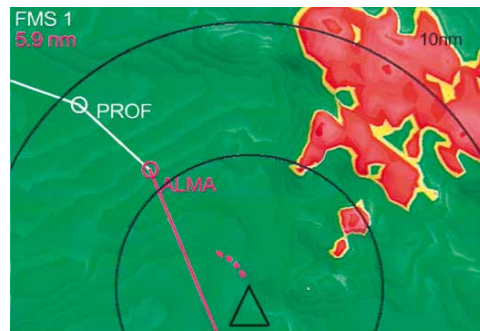
- Universal Avionics Electronic Flight Instrument System
- L-3 Com Avionics Electronic Standby Instrument Systems
- Dual AEE Analog-Digital Converting System (EIU)
- AEE Central Advisory and Warning System

Recording Systems

- L3-Com Solid State Flight Data Recorder with Flight Data Acquisition Unit (optional)
- L3-Com Solid State Cockpit Voice Recorder (optional)

Emergency Equipment

- Emergency Locator Transmitter



TAWS – A unique 3-D perspective view provides the optimum level of situational awareness.

Communication Systems

Dual Rockwell Collins VHF Communication System

- two independent VHF COM transceivers and antennas

Digital Becker Avionics Intercommunication System

- two audio control units installed in the center pedestal and one remote electronic unit
- provides communication between pilot, co-pilot, operator and observers and monitoring of all COM and NAV radio equipment.

Dual Universal Avionics Radio Control Units RCU

- two radio control units installed in the center pedestal
- primary means of control for all onboard radios without a dedicated control unit

Rockwell Collins V/UHF Communications System (optional)

- accommodates full range of ECCM (el. counter-countermeasures) waveforms

HF Communication System (optional)

- long range communication and data transmission
- inverted-V antenna between top of fuselage tail section and vertical stabilizer

SELCAL Decoder (optional)

- allows an aircraft crew to be notified of incoming communications even when the aircraft's radio has been muted

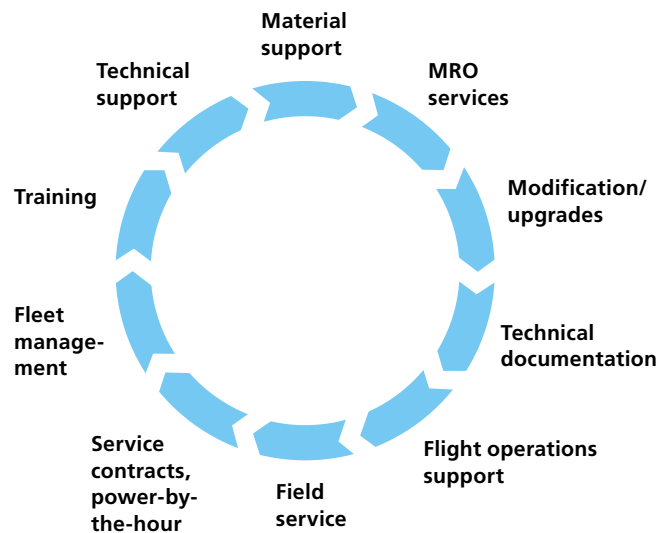
SATCOM (optional)

- provides secure video, data, voice and IP

Life Cycle Support

As manufacturer of the Dornier 228 RUAG also offers comprehensive support services, ensuring that the aircraft can be operated safely, economically and in accordance with the customer's requirements at any time.

RUAG's international, customer support services comprise technical support and supply of spare parts, documentation, field service and training. In addition, RUAG offers operators of special versions and small fleets of the Dornier 228 its Total Aircraft Care service, which provides full technical support and guaranteed availability for a fixed price per flight hour.



Technical and Operational Support

Between 1982 and 2002, well over 200 Dornier 228s were built in Oberpfaffenhofen and were marketed worldwide. About 150 machines are still in service today, and many of these are serviced by RUAG.

As holders of the type certificate of the Dornier 228 and licences EASA 21G, EASA 21J, EASA 145 and FAR 145, we offer comprehensive servicing for the Dornier 228 fleet operating worldwide. The scope of our services is as follows:

- Technical support beyond the basic documentation, e.g. with Service Problem Report (SPR) and Repair Approval Sheet (RAS) for complex repairs
- Modifications – e.g. customer-specific mission equipment, engine and avionic upgrades
- The whole range of maintenance work (Line & Base) including engine inspections
- Complete and partial painting in our state-of-the-art paint shop
- Service contracts, Power-by-the-Hour contracts
- Fleet management in line with CAMO
- Training for pilots and maintenance staff
- Spare parts support

24-hour – AOG Hotlines

Technical Support

Tel.: +49 8153 30 – 2280

Fax: +49 8153 30 – 3030

E-mail: custsupport.dornier228@ruag.com

Material Support

Tel.: +49 8153 30 – 2281

Fax: +49 8153 30 – 4633

E-Mail: matsupport.dornier228@ruag.com

Contents

2 Content Overview

4 Operations

- 4 Operation Challenges
- 5 Advanced Commuter
- 6 Operations All Around the World
- 8 Light Transport
- 10 Passenger Transport

14 Aircraft

- 14 Specifications
- 16 Performance
- 17 Certification Basis
- 18 Construction and Fuselage
- 20 Main Wing
- 22 Engines and Propellers

24 Cockpit

- 24 Glass Cockpit
- 26 Avionics
- 27 Communication Systems

28 Operations Support

- 28 Life Cycle Support
- 29 Technical and Operational Support

30 Contents





RUAG Aerospace Services GmbH | RUAG Aviation
P.O. Box 1253 | Special Airfield Oberpfaffenhofen
82231 Wessling | Germany
Phone +49 8153 30-2011 | info.de.aviation@ruag.com
www.dornier228.com

**Together
ahead. RUAG**